

5           **METHOD FOR PROCESSING CONNECTION REQUEST OF A DISK PLAYER**

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**CROSS-REFERENCE TO RELATED APPLICATIONS**

10           **[0001]**   Pursuant to 35 U.S.C. § 119(a), this application  
claims the benefit of earlier filing date and right of Korean  
Patent Application No. 10-2003-14164, filed on March 6, 2003, the  
content of which is hereby incorporated by reference herein in its  
entirety.

15                           **BACKGROUND OF THE INVENTION**

**Field of the Invention**

**[0002]**   The present invention relates to a method for  
setting a playback environment for reproducing audio/video (A/V)  
data in an interactive or enhanced recording medium, such as an  
20 interactive digital versatile disk (also known as I-DVD or  
Enhanced Digital Versatile Disk (ENAV)), along with additional  
contents associated with the A/V data.

**Description of the Related Art**

**[0003]**   High-density optical disks (e.g., digital versatile

disks (DVDs)) are capable of recording and storing large-capacity digital data. The DVDs are large-capacity recording mediums capable of permanently recording and storing not only high-quality digital audio data, but also high-quality moving picture data.

5       **[0004]**     A DVD includes a data stream recording area for recording a digital data stream, such as moving picture data and a navigation data recording area for recording navigation data needed for controlling playback of the moving picture data. A typical DVD player first reads the navigation data recorded on the  
10 navigation data recording area, if the DVD is seated in the player, stores the read navigation data in a memory provided in the player, and reproduces the moving picture data recorded on the data stream recording area using the navigation data.

**[0005]**     The DVD player reproduces the moving picture data  
15 recorded on the DVD, such that a user can view and hear a movie recorded on the DVD. Information (control or additional information) associated with the playback of audio/video (A/V) data recorded on the DVD can be recorded as a file written in a hypertext markup language (HTML) on the DVD. Standardization work  
20 of an interactive digital versatile disk (I-DVD) is ongoing. The A/V data recorded on the I-DVD is reproduced according to the user's interactive request. Where I-DVDs are commercialized, the supply of contents through digital recording mediums will be more prevalent.

25       **[0006]**     A method is being developed for seamlessly and

continuously reproducing A/V data in an I-DVD, at the time of a synchronous playback operation for the A/V data and additional contents, i.e., ENAV data, associated with the A/V data recorded on the DVD. Various playback environments must be set before the  
5 data of the disk is reproduced so that the A/V data and the ENAV data on the disk can be seamlessly reproduced and outputted under limited resources of the player.

### **SUMMARY OF THE INVENTION**

**[0007]** In accordance with one or more embodiments, a  
10 method for connecting a media player to a remote server comprises processing a request for connecting to an remote server while reproducing data recorded on an enhanced navigation medium; processing connection information recorded on the enhanced navigation medium to determine whether connection to  
15 the remote server is permitted; and requesting connection to the remote server, if connection to the remote server is permitted in accordance with the connection information.

**[0008]** The connection information is recorded in a start-up file that is read prior to reproduction of the data recorded  
20 on the enhanced navigation medium. The start-up file comprises information associated with a list of additional contents to be loaded before the data on the enhanced navigation medium is reproduced. The start-up file comprises information associated

with a right to reproduce the data recorded on the enhanced navigation medium.

**[0009]** In some embodiments, the start-up file comprises information associated with a region code, a language of the  
5 additional contents, memory management, and a file to be processed after the start-up file is processed. The connection information comprises a list of servers to which the media player may connect or alternatively a list of servers to which the media player may not connect.

10 **[0010]** The data recorded on the enhanced navigation medium comprises audio/video (A/V) data. The data recorded on the enhanced navigation medium comprises additional contents associated with the A/V data, in some embodiments, for example. The A/V data and the additional contents are reproduced in  
15 synchronization.

**[0011]** The connection information comprises at least one connection address for connecting to the remote server. The start-up file comprises the connection information, wherein the start-up file comprises information associated with a walled-  
20 garden file comprising location information about at least one server.

**[0012]** The walled-garden file comprises information about at least one server to which the media player may connect to retrieve additional contents associated with the data recorded  
25 on the enhanced navigation medium. In one embodiment, the

walled-garden file comprises information about at least one server to which the media player may not connect to retrieve additional contents associated with the data recorded on the enhanced navigation medium.

5       **[0013]**   The walled-garden file comprises at least one entry associated with loading information that controls access to information available on the at least one server. The loading information comprises at least a condition for loading information available on the at least one server, and at least  
10 one of a language or a profile supported by the media player.

**[0014]**   In one or more embodiments, a method for processing a connection request of an enhanced navigation media player comprises determining a current operating mode and connection limitation information, in response to a connection request for  
15 connecting the player to a remote server; and submitting the request to the remote server to establish a connection, based on the current operating mode and the connection limitation information.

**[0015]**   The connection request is submitted, if the current  
20 operating mode is an enhanced navigation playback mode. Also, the connection request is submitted, if the connection limitation information provides permission for the remote server to be contacted. That is, the connection request is submitted, if the current operating mode is an interactive disk playback  
25 mode and if the connection limitation information indicates that

the remote server may be contacted.

**[0016]** In certain embodiments, the connection limitation information is recorded in a start-up file residing on an enhanced navigation medium. The start-up file is read prior to  
5 the player reproducing data recorded on the enhanced navigation medium. The start-up file comprises information associated with a list of additional contents to be loaded before data recorded on the enhanced navigation medium is reproduced.

**[0017]** In accordance with another embodiment, an enhanced  
10 navigation media player for processing data recorded on a recording medium is provided. The player comprises an audio/video (A/V) player engine; and an enhance navigation (ENAV) engine, wherein if the recording medium is not an enhance navigation medium then A/V data recorded on the recording medium  
15 is reproduced by the A/V player engine, and wherein if the recording medium is an enhanced navigation medium, than a start-up file is loaded into a first memory so that the ENAV engine can extract connection information about at least one server with additional contents.

20 **[0018]** In one or more embodiments, the start-up file comprises information associated with a walled-garden list that provides the connection information about the at least one server. The start-up file may also comprise loading information that controls access to the additional contents available on the  
25 at least one server. The loading information comprises at least

a condition for loading the additional contents available on the at least one server, a language condition to limit access to the additional contents available on the at least one server based on the language condition, a profile condition to limit access 5 to the additional contents available on the at least one server based on the profile condition, and parental condition to limit access to the additional contents available on the at least one server based on the parental condition.

**[0019]** In some embodiments, an enhanced navigation 10 recording medium comprises audio/video (A/V) data; and connection information for controlling access to additional contents available through at least one remote server, wherein the additional contents is reproduced in synchronization with the A/V data. The connection information comprises at least a condition 15 for loading the additional contents available on the at least one server and a language condition to limit access to the additional contents available on the at least one server based on the language condition.

**[0020]** A profile condition to limit access to the 20 additional contents available on the at least one server based on the profile condition, and parental condition to limit access to the additional contents available on the at least one server based on the parental condition, may be also included. In one embodiment, the connection information limits access to the at 25 least one remote server or permits access to the at least one

remote server.

[0021] In accordance with yet another embodiment, a method of playing back audio/video (A/V) data recorded on an enhanced navigation medium comprises identifying a playback mode; decoding  
5 a start-up file recorded on the enhanced navigation medium, if the playback mode identifies an enhanced navigation mode, wherein the start-up file comprises first and second information; decoding the first information to determine location of at least one remote server that provides access to additional contents to be played  
10 back in synchronization with the A/V data; and decoding the second information to determine at least one condition associated with the additional contents.

[0022] In one embodiment, a first enhanced navigation application is launched based on the decoded first and second  
15 information. The second information comprises at least one of a profile, language, and parental condition for loading the additional contents, for example.

[0023] These and other embodiments of the present invention will also become readily apparent to those skilled in the art from  
20 the following detailed description of the embodiments having reference to the attached figures, the invention not being limited to any particular embodiments disclosed.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

25 [0024] The accompanying drawings, which are included to



provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

5       **[0025]**     Fig. 1 is a block diagram of an optical disk device to which a method for setting a playback environment of an interactive disk, in accordance with one embodiment of the invention, is applied;

**[0026]**     Fig. 2 is a schematic diagram illustrating a  
10   directory structure of an interactive digital versatile disk (I-DVD) in accordance with one embodiment of the invention; and

**[0027]**     Fig. 3 is a flowchart illustrating a method for setting the playback environment of the interactive disk, in accordance with an embodiment of the invention.

15       **[0028]**     Features, elements, and aspects of the invention that are referenced by the same numerals in different figures represent the same, equivalent, or similar features, elements, or aspects in accordance with one or more embodiments of the system.

#### **DESCRIPTION OF THE PREFERRED EMBODIMENTS**

20       **[0029]**     Referring to Fig. 1, in accordance with one embodiment of the present invention, an optical disk device comprises an optical pickup 11 that reads a signal recorded on an enhanced navigation recording medium such as an interactive

digital versatile disk (I-DVD) 10. A signal processor 12 processes a read radio frequency (RF) signal and recovers digital data. A memory unit 13 stores the recovered data and externally received data. A DVD engine 14 decodes the data stored in the 5 memory unit 13. An iDVD engine 15 interprets an information file stored in the memory unit 13, and processes certain additional contents (i.e., ENAV data).

**[0030]** A synthesizer 18 synthesizes and outputs an A/V signal from the DVD engine 14 and another A/V signal from the iDVD 10 engine 15. A network interface 17 performs a network connection function and a web browser function. A control unit 16 sets a playback environment of the I-DVD 10 and controls the above-described components so that data of the I-DVD 10 can be reproduced along with the additional contents, under the set 15 playback environment.

**[0031]** An exemplary directory structure of the I-DVD 10 is shown in Fig. 2. An additional contents directory "DVD\_ENAV" 203 is arranged under a root directory and comprises a start-up file " StartUp.mls" 204, for example. The start-up files comprises 20 information about the system environment settings. In some embodiments, the environment is set before data of the I-DVD is reproduced.

**[0032]** An information file "EnDVD.Inf", for example, for reproducing A/V data recorded on the I-DVD, an initial screen 25 setup file "index.html", for example, for playback, and

synchronization file "index.syn", for example, for the synchronization between data items of different attributes may be part of the start-up file or settings. The directory "DVD\_ENAV" 203 may further comprise a fonts directory 206 storing font files 5 for outputting a text of the additional contents.

**[0033]** In some embodiments, an additional contents directory 207 comprising the additional contents for providing additional A/V contents (i.e., ENAV data files 208, html files, image files, sound files, etc.) may be present. The additional 10 contents directory 207 can comprise additional contents (for example, e.g., subdirectories 209), on the basis of a hierarchical structure, for example.

**[0034]** A video title set directory "Video\_TS" 201, for example, comprising video data and an audio title set directory 15 "Audio\_TS" 202, for example, comprising audio data is arranged under the root directory, in some embodiments. An item of disk version information associated with the I-DVD and an item of contents manufacturer information are recorded in, for example, the "EnDvd.inf" file of the directory 203. Further, uniformed 20 resource identifier (URI) information associated with a contents provider's server for providing, through a communication network, the additional contents information relating to A/V data to be read and reproduced from the I-DVD can be recorded in the directory 203.

25 **[0035]** Items of setup information for the initial screen

setting at the time of reproducing the data of the interactive DVD  
can be recorded in the setup file "index.html" of the directory  
203. Items of time stamp information for performing the  
synchronization between the A/V data and ENAV data to be read and  
5 reproduced from the I-DVD are recorded in the synchronization file  
"index.syn".

[0036] Before the A/V data of the I-DVD is reproduced,  
various information items for system environment setting are  
recorded in the start-up file "StartUp.mls", for example. The  
10 various information items may comprise information about contents  
to be loaded in a memory before the playback, location information  
of a source for providing the contents information, a parental ID  
indicating a right to access the recorded A/V data, the language  
of the additional contents, a website connection during the  
15 playback, memory management information, a file to be processed  
after the start-up file is processed, and a version of the start-  
up file.

[0037] Referring to Fig. 3, a method for reproducing the  
data of the I-DVD 10 is provided. If a disk is inserted and  
20 seated within the player shown in Fig. 1, at step S1, then the  
control unit 16 searches for a "StartUp.mls" or "EnDVD.Inf" file  
from a "DVD\_ENAV" directory, for example. If a corresponding  
file is found, the seated disk is detected as an I-DVD, at step  
S10. Otherwise, the seated disk is detected as a general DVD.

25 [0038] If the seated disk is a general DVD, the control

unit 16 performs a playback operation in a general DVD mode in response to a user request, at step S30. If the playback operation is completed, procedure ends. In the playback operation of the DVD mode, data reproduced from the disk is processed  
5 through the DVD engine 14 and the processed data is outputted as a video and audio signal.

**[0039]** On the other hand, if the seated disk is an I-DVD 10, it is determined whether data of the I-DVD is to be reproduced in an enhanced mode, at step S11. The enhanced mode is a  
10 synchronous playback mode for the additional data (i.e., ENAV data). The enhanced mode can be turned ON/OFF by the user. The initial setting corresponds to an ON state, in one embodiment. If the enhanced mode is in an OFF state, the above-described general DVD playback operation is performed at the above step S30, even  
15 if the seated disk is an I-DVD.

**[0040]** In certain embodiments, if the enhanced mode is in an ON state, the start-up file "StartUp.mls", for example, arranged under the "DVD\_ENAV" directory is read, at step S12. The start-up file is stored in the memory unit 13, and the iDVD engine  
20 15 is requested to interpret the start-up file. In one embodiment, the iDVD engine 15 interprets the start-up file "StartUp.mls" stored in the memory unit 13, and confirms a parental ID for authorization to reproduce data of the I-DVD at step S13. The iDVD engine then sets a system state, at step S14.

25 **[0041]** Information of the system state comprises

information associated with a language to be used at a time of processing the ENAV data, website connection limitation (i.e., walled garden list), memory management, loading information, etc.

For example, the system state can be defined as:

```
5      <conf type=language con=euc-kr>
      <wgarden>http://www.warner.com</wgarden>
      <memset>
10     <pload>36</pload>
      </memset>
```

**[0042]** In this exemplary embodiment, The tag "<conf type>", for example, designates the Korean language as the used language. A tag "<wgarden>", for example, designates the website connection limitation or the walled garden list. The tag "<wgarden>", for example, indicates that connections to web sites other than "http://www.warner.com", for example, are not allowed. In conjunction with the memory setting, a tag "<pload>", for example, designates a memory space to be occupied. The tag "<pload>" indicates that a memory space of 36 Mbytes in the memory is occupied, in one or more embodiments. The loading information, for example defines a list of URIs to be preloaded into a memory space and can also provide and ENAV buffer configuration.

**[0043]** The website connection limitation information (i.e., the walled garden list") can comprise a plurality of website addresses. The website connection limitation information is provided to the network interface 17. Then, while the data of the I-DVD is reproduced, the website connection limitation information can be referred to by the user at a time of surfing the web, for

example.

[0044] In certain embodiments, the walled garden list includes information about websites that can be accessed during the I-DVD playback. In other embodiments, the walled garden list 5 includes information about websites that cannot be accessed during the I-DVD playback. Other implementations are also possible, where a combination of access permission or restrictions may be granted, according the content of the walled garden list.

[0045] The iDVD engine 15 confirms a version of a 10 preloading list from the start-up file, and transmits the confirmed version information to a specified server through the network interface 17, at step S15. Location information of the specified server can be confirmed from information designated in the tag "<wgarden>", for example, or from URL information recorded 15 in the "EnDvd.inf" file. A corresponding server receiving the version information transmits the preloading list of a latest version to the player, if the latest version higher than the received version exists in the server. In one embodiment, if the latest version higher than the received version does not exist, 20 the corresponding server notifies the player that the received version is the latest version.

[0046] If the preloading list is downloaded, the memory unit 13 receives and stores the downloaded list. The downloaded list is used as preloading information. If the preloading list is 25 not downloaded, the preloading list contained in the start-up file

is used as the preloading information, at step S16. Contents recorded in the preloading list and certain ENAV data (e.g., html files, image files, sound files, text files, etc.) is stored in the memory space designated by the above-described tag "<pload>".

5       **[0047]**     The preloading list can be defined in the following formats, in one or more embodiments. Files to be preloaded can vary according to a level of a right to reproduce the data of the DVD as described below or according to a region code.

```
10       <preload>
          <unit no="1">
            <DATA name="aaa" able="TRUE">
              <INDEX>2th</INDEX>
              <TYPE>doc</TYPE>
15        <src    t_ID="5"    t_lang="all">http://www.disney.com/a/b.htm
          </src>
          <src    t_ID="1"    t_lang="all">http://www.disney.com/a/c.htm
          </src>
          </DATA>
20        ...
          </unit>
          ...
          </preload>
```

**[0048]**     In the above example, "unit" means a section in  
25 which the ENAV data is seamlessly reproduced along with the A/V data linked to the ENAV data. All A/V data items recorded on the I-DVD (i.e., titles) can be configured by one or more applications. One application can be linked to one ENAV unit. An additional contents item to be preloaded for each unit (i.e., an  
30 ENAV data item) is defined by a tag "<DATA>" contained in the unit. In the above example, if a playback level (parental ID) is confirmed from the start-up file (i.e., t\_ID, is "5") then a file of <http://www.disney.com/a/b.htm>, for example, is loaded in the



memory unit 13.

[0049] If a playback level (parental ID) is confirmed from the start-up file (i.e., t\_ID, is "1"), then a file of <http://www.disney.com/a/c.htm>, for example, is loaded in the  
5 memory unit 13. The file to be preloaded can be in a remote web site, according to the above-described example, but the file also can be designated as a file recorded in the specified directory of the seated disk. In some embodiments, data files for presentation of "html" files (e.g., image files), sound files, or banner files)  
10 are designated under a subsequent tag "<DATA>", for example. \*\*

[0050] Thus, items designated in each tag "<DATA>" are, for example, read from the seated disk or received from a remote server. The read or received items are sequentially stored in the memory unit 13, in one embodiment. If all files designated within  
15 the unit "<unit>", for example, for one application have been stored, a preloading operation is completed, at step S17. If size of files designated within the one unit exceeds, for example, 36 Mbytes described above, the preloading operation is terminated, even if the preloading operation for another unit is not  
20 completed.

[0051] In one embodiment, the iDVD engine 15 confirms, from the start-up file, a file (e.g., a setup file "index.html") designated to be performed after the start-up file is performed. The iDVD engine 15 requests the control unit 16 to read the  
25 confirmed file from the I-DVD 10. If the setup file is loaded in

the memory unit 13 in response to the request, the iDVD engine 15 interprets the file at step S18, and configures and outputs an initial screen by the user's selection.

**[0052]** If the user selects "playback start" from the initial screen, the control unit 16 requests the iDVD engine 15 to notify it of a confirmed playback right level. The control unit 16 compares the playback right level received from the iDVD engine 15 with a playback right level set in the player. If the playback right level set in the player is lower than the playback right level confirmed from the start-up file, the control unit 16 does not perform the requested playback, and configures and outputs a message indicating that the requested playback cannot be performed.

**[0053]** In one embodiment, if the playback right level set in the player is not lower than the playback right level confirmed from the start-up file, the control unit 16 begins to reproduce the data of the seated I-DVD 10. A region code set in the player is compared with a region code confirmed from the start-up file. If the region code set in the player is different from the region code confirmed from the start-up file, the playback operation is not performed. Otherwise, the playback operation can be performed.

**[0054]** If the playback operation is initiated, the control unit 16 buffers recorded A/V data in the memory unit 13 while driving the seated I-DVD 10. The buffered A/V data is decoded by

the DVD engine 14 so that an A/V signal can be outputted. During this operation, the iDVD engine 15 reads the ENAV data preloaded in the memory unit 13, and performs a decoding operation to output an A/V signal. The A/V signal from the iDVD engine 15 is  
5 synthesized with an output signal from the DVD engine 14 by the synthesizer 18. The synthesized signals are outputted externally, at step S19.

**[0055]** In some embodiments, the iDVD engine 15 refers to synchronization information (e.g., linkage information between  
10 each file name and time) recorded in a synchronization file "index.syn" to synchronize files configuring the ENAV data with A/V data being reproduced from the I-DVD 10. When a latest version list associated with a preloading list designated in a start-up file "StartUp.mls" recorded on the I-DVD 10 is received  
15 from a remote server, a synchronization file "index.syn" is also received. The received synchronization file "index.syn" can be used in place of a synchronization file "index.syn" recorded in the I-DVD 10.

**[0056]** If ENAV data units for a current application  
20 preloaded in the memory unit 13 have been outputted, at step S20, the iDVD engine 15 notifies the control unit 16 that some or all of the ENAV data units have been outputted. In response to the notification, the control unit 16 stops the operation of the DVD engine 14. Then, the iDVD engine 15 refers to the above-described  
25 interpreted preloading list information, and preloads ENAV data,

such as the ENAV units of a next application, in the memory unit 13.

**[0057]** When a file to be preloaded matches a file preloaded in the memory unit 13, for example, a corresponding file is not 5 newly loaded. That is, the corresponding file is not read from the I-DVD 10 or not received from an external server. Data of a previous file stored in the memory unit 13 is used, at step S21, in one embodiment. The exclusion of a loading operation repeat can reduce a preloading time. If the ENAV data of next units has 10 been loaded, then the control unit 16 is notified that the ENAV data has been completely loaded, and the playback operation is initiated from a point when it has been stopped.

**[0058]** The A/V data recorded on the disk and additional contents (ENAV data) associated with the A/V data are synchronized 15 with each other and seamlessly outputted in a synchronized state. The above-described operation is continuously performed until the I-DVD playback is completed or a playback stop request is received from the user, at step S26.

**[0059]** If the user makes a specified website connection 20 request, at step S23 in a synchronous playback or non-playback state, the control unit 16 provides input information to the network interface 17 and requests the network interface 17 to perform a specified website connection. Then, the network interface 17 determines whether a website address for the 25 specified website connection is contained in previously received

website connection limitation information, at step S24. If so, the network interface 17 sends a connection request with a received address, and receives a corresponding web page to store the received web page in the memory unit 13, at step S25. The  
5 iDVD engine 15 interprets the stored web page, and then a video signal is outputted on the basis of the interpreted web page.

**[0060]** If a website address for the specified website connection is not contained in previously received website connection limitation information, the network interface 17  
10 confirms a current operating mode through the control unit 16. If the current operating mode is in the non-playback state or a general DVD playback state, then an operation is performed as in the case where the website address for the specified website connection is contained in the previously received website  
15 connection limitation information.

**[0061]** If the current operating mode is in an I-DVD playback state, the connection to the web site based on the request is not performed. At this time, the control unit 16 outputs a message indicating that the connection to the website  
20 based on the request cannot be performed in the I-DVD playback state.

**[0062]** In some embodiments, this website connection limitation information is set in the start-up file "StartUp.mls" by a manufacturer of the I-DVD such that a time delay or the  
25 memory's load caused by a certain website connection can be

prevented in the I-DVD playback state.

**[0063]** Embodiments of the invention are described by way of example as applicable to systems and corresponding methods that provide a method for processing a connection request of a disk  
5 player. In this exemplary embodiment, logic code for performing these methods is implemented in the form of, for example, application software. The logic code, in one embodiment, may be comprised of one or more modules that execute on one or more processors in a distributed or non-distributed communication  
10 model.

**[0064]** It should also be understood that the programs, modules, processes, methods, and the like, described herein are but an exemplary implementation and are not related, or limited, to any particular computer, apparatus, or computer programming  
15 language. Rather, various types of general-purpose computing machines or devices may be used with logic code implemented in accordance with the teachings provided, herein. Further, the order in which the steps of the present method are performed is purely illustrative in nature. In fact, the steps can be  
20 performed in any order or in parallel, unless indicated otherwise by the present disclosure.

**[0065]** The method of the present invention may be performed in either hardware, software, or any combination thereof, as those terms are currently known in the art. In particular, the present  
25 method may be carried out by software, firmware, or macrocode

operating on a computer or computers of any type. Additionally,  
software embodying the present invention may comprise computer  
instructions and stored on a recording medium of any form (e.g.,  
ROM, RAM, magnetic media, punched tape or card, compact disk (CD),  
5 DVD, etc.). Furthermore, such software may also be transmitted in  
the form of a computer signal embodied in a carrier wave, or  
accessible through web pages provided on computers networks such  
as the Internet, for example. Accordingly, the present invention  
is not limited to any particular platform, unless specifically  
10 stated otherwise in the present disclosure.

**[0066]** The present invention has been described above with  
reference to preferred embodiments. However, those skilled in the  
art will recognize that changes and modifications may be made in  
these preferred embodiments without departing from the scope of  
15 the present invention. The embodiments described above are to be  
considered in all aspects as illustrative only and not restrictive  
in any manner. Thus, other exemplary embodiments, system  
architectures, platforms, and implementations that can support  
various aspects of the invention may be utilized without departing  
20 from the essential characteristics described herein. These and  
various other adaptations and combinations of features of the  
embodiments disclosed are within the scope of the invention. The  
invention is defined by the claims and their full scope of  
equivalents.